

The thesis resums the base knowledges of the domain of the fluid mechanics, deduction of the Navier-Stokes equations, introduction of the Reynolds number and its difference and a fundamental deduction of the Stokes formula, expressing a depending of the resistance of a fluid on a moving sphere. There are the problematic of turbulence including of energetical spectrum by Kolmogorov, cascade mechanism of disintegration of vortices and Kolmogorov length analysed too. There are introduced vorticity and Rayleigh number the exploration of the classical turbulence using liquid helium 4 in this thesis. There are stated the basical physical possessions of the helium 4 here, including of its phase diagram and double-componental model. Special chapture pays attention to the hydrodynamics o helium 4, especially to the relation from pressure to temeprature. After it comes introduction to quantum turbulence, including of the basical formulae and description of the used experimental method of the partical tracker, as well asthe basical motivation of the problem. There is calculated an approximate calculation of the interaction between a particle and a laser beam, as well as an exact calculation for a spherical particle. During the calculation is presumed incompressible, non-vortucose flowing, using basical formulae for velocity of liquiad helium and superfluid formulad boundary conditions and solved the Laplace equation. Pressure was calculated using the Euler equation, which was necessary for calculation of the stress tensor, necessary to calculate a force, depending on the particle and afterward an angle from the vertical axes. Newly calculated formula was compared with experimental data. There were gained an experimental dependence of deviation of the horizontal velocity distribution of particles and a dependence of angle on radius of particles was measured. The dependence of the laser power on particles was assessed on these data.